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How to manage people who think

A structural approach

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Abstract:

This is a paper about creativity, diversity and other often used buzzwords. It is also a paper about how to manage people who think. Today we live in a world in which computers and mobile phones have become the key artifacts. Nokia's slogan "connecting people" expresses in a brilliant way what it is all about. When we connect people information is transferred and new knowledge hopefully created. And innovations, ideas and individuals are central for everything that takes place. We are all supposed to be flexible, exercising our knowledge in a setting characterized by diversity. This setting is also characterized by paradoxes that I will write more about further down. But transformations such as the globalization and implementing of new information technology raise crucial questions about how to deal with a changing economic landscape and new mindsets and changing attitudes. The pages that follow are based on extensive reading of the literature and participating in many conferences and work-shops. In addition to this I have interviewed managers and employees at Electrolux, Ericsson, TeliaSonera and The Confederation of Swedish Enterprise. I have asked people in the above mentioned organizations how they react to concepts such as the knowledge society and the practice of managing knowledge, creativity, diversity and flexibility. This paper is written with a Scandinavian perspective. It is also written with a social constructionist perspective. The theoretical framework includes theories about knowledge management, structuration theory and cognitive theories. The findings are based on interpretative research and I have systematically reflected over the material I have collected. I direct myself towards people in business who think and worry about the future. The purpose is to inspire to further discussions about these very important matters.

Keywords: knowledge management, structuration theory, knowledge society, globalization, creativity, diversity, flexibility.

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Preface

I will start by writing a few words about the title of this paper. Of course all human beings think both in daily life and at work. Some also mean that the division between skilled and unskilled labour, and people who think and “not think” is not relevant anymore. But I still state that I study people who have thinking as a profession. What I mean with that is that I’m interested of professionals that base their knowledge on scientific thinking when they diagnose a problem and decide on action. In this paper I call them knowledge workers-they have also been called the creative class. They include not only the classical professions such as doctors and lawyers but also jobs such as analysts, industrial designers, program developers and web designers. More and more people are supposed to produce ideas and innovations as an important part of their professional life. The need for new products, new design, new way to market these products and so on increase all the time. The research that this paper is based on is inspired by the British sociologist Anthony Giddens. The first time I read him was during the 1980ies. Later I also read his book *Modernity and Self-Identity*, published 1991, which in an interesting way captured some tendencies in modern society that was felt and discussed by many. A few years ago I rediscovered Giddens when I saw his ideas about the duality of structure acted out in real life. I studied how a computerized document was influenced by the context in which it was used and how it influenced the same context. Then I became interested of how knowledge is structured in organizational settings and used Giddens structuration theory in my thesis. In this paper I continue using some of Giddens basic concepts and the relationships between them. I characterize this paper as “work in progress”. Eventually it is going to result in a book that will include more material than this paper do.

1. Points of departure

This is a paper about creativity, diversity and other often used buzzwords. It is also a paper about how to manage people who think. Today we live in a world in which computers and mobile phones have become the key artifacts. Nokia’s slogan “connecting people” expresses in a brilliant way what it all is about. When we connect people information is transferred and new knowledge hopefully created. Innovations, ideas and individuals are central for everything that takes place. We are all supposed to be flexible, exercising our knowledge in a setting characterized by diversity. This setting is also characterized by several paradoxes that I will write more about further down. But transformations such as the globalization and implementing of new information and communication technology raise crucial questions about how to deal with a transformed economic landscape that demands new mindsets and changing attitudes.

1.1 A Social constructionism in Scandinavia

This paper is written with a Scandinavian perspective. It is also written with a social constructionist perspective. I direct myself toward people in business who think and worry about the future. In short I characterize the Scandinavian perspective as anti-elitist. It is oriented towards the collective. The individual rely on institutions for action. And organizations are not hierarchical. Different stakeholder groups often have a strong say in what takes place.

Then the overall ontological perspective guiding this research is that we belong to several thinking collectives (*denk-kollektiv*) each characterized by a special thought style (Fleck,

1934/1997) and that parts of our world are socially constructed. (Mead, 1934, Blumer, 1969/1998, Schutz, 1953 / 1962, Berger and Luckmann, 1966/1991, Sjöstrand, 1997) My purpose in this section is not to describe and discuss social constructionism in detail. I will just repeat that the common features of social constructionism is a rejection of a dualistic ontology, of an objectivist epistemology, of the individual as the foundation of knowledge and of language as a mirror of objective reality. Instead social constructionism regards subject and object as an inseparable relation. In the social construction of reality there is an ongoing dialectical process between subjective and objective reality. It can be described as externalization, objectivation and internalization. During primary socialization we internalize language, greetings and gender, things that regulate the most common activities and interactions among people. Later secondary socialization includes processes in which individuals internalize aspects of reality such as professions. As we increasingly become part of reality through primary and secondary socialization, we begin to reproduce it ourselves. So what is going on in our everyday world is an ongoing reproduction rather than an ongoing production of reality. Reality is mediated through our lived experiences. Our description of a phenomenon is always colored by our specific historical, cultural and linguistic understanding of reality. Social interactions between people is the primary vehicle for developing this knowledge. And language does not achieve its meaning primarily through a correspondence with objective reality, but rather through the way we socially define and use it. Mead (1934) looks at language as a principle of social organization which has made the distinctively human society possible. It means that it is important what people say and how they say it.

1.2 Interpretative research and systematic reflection

The pages that follow are based on extensive reading of the literature and participating in many conferences and work-shops. In addition to this I have interviewed managers and employees at Electrolux, Ericsson, TeliaSonera and The Confederation of Swedish Enterprise. I have asked people in the above mentioned organizations how they react to concepts such as the knowledge society and the practice of managing knowledge, creativity, diversity and flexibility. This paper is based on interpretative research and I have systematically reflected over the material I have collected.

First I will write a few words about the globalized landscape, then about the knowledge society. I suggest that there is a continuous structuring of knowledge going on in this society. I continue writing about knowledge as a concept and a phenomenon, knowledge workers and the challenging practice of managing knowledge. Then I discuss two interrelated concepts- knowledge structuring and knowledge domination. Finally I summarize this paper and its implications for the question that this paper poses:-How to manage people who think?

2.A globalized landscape

Today we walk around in a landscape in which there are many and sometimes contradicting forces. The word globalization refers to the increasing integration of economies around the world. Technological advances have made it easier and quicker to complete international transactions. Global markets are supposed to promote efficiency through competition and the division of labor, the specialization that allows people and economies to focus on what they do best.

“We have the same amount of employees today as we had 1995 but the turnover is twice as much. We have not raised our prices since we started 1992. We must all the time produce cheaper but with improved quality. Then the development and implementation of new technology is important”, says one of the people I have interviewed who is a medium sized entrepreneur.

Both people and knowledge move across international borders. There are cultural, political and environmental dimensions of globalization. Direct foreign investment brings not only an expansion of the physical capital stock, but also technical innovation. Knowledge of production methods, management techniques, export markets and economic policies is available at a very low cost, and it represents a highly valuable resource. Information exchange is an important aspect of globalization.

Also trademarks, ideas and certain mental frameworks become globalized. But at the same time there is an increasing gap between rich and poor countries and between rich and poor people within these countries. There is a discussion going on if this is a beneficial process or not. Some say that it is inevitable and irreversible. Others regard it with fear and think that it makes the world more instable. Some even complain that we have surrendered to gobalization and boundless and endless pursuit of profit. Others believe in a bright future.

“I have stopped being upset that production dissappear...That force is so strong that it is not much we can do...I also feel that we have to blame ourselves...many industries have problems because they have not invested enough. In Electrolux we often meet problems at the factories...they say that no we cannot produce this or that because we have not invested in these machines...It becomes an evil circle...But my responsibility as an industrial designer is to produce something that the customer like... (industrial designer at Electrolux)

“I, as a designer see a pattern in which units become obsolete because they do not invest and modernize...”

Globalization offers extensive opportunities for truly worldwide development but it is not progressing evenly. Markets do not necessarily ensure that the benefits of increased efficiency are shared by all. Some countries and some groups are becoming integrated into the global economy more quickly than others. When living standards rise it also becomes possible to make progress on democracy and environment and work standards.

An interesting thought is that the Chinese middle class consisted of 50 million people two years ago. And they make almost as much money as we do. Ten years from now they are predicted to be 400 million people. These people are willing to invest and buy expensive status products. In addition to this China have initiated a rural initiative to try to lift the people on the country side from poverty. Then the infrastructure when it comes to health and environmental questions are important. Now China also want to be a knowledge economy, according to the chinese prime minister. They want to get away from all the low status jobs that the west want to dump on them. When it comes to research the big universities ask Chinese people who have got their PHD abroad to come back to China and offer them good compensation packages. At the same time many wellknown western intellectuals are willing to lecture for free in China. The biggest foreign tourist group visiting the Wasa Ship in Stockholm is Chinese. I want to point out that all these phenomenas will have implications for the future.

Being lean, taking time to know your customers and maximizing the advantages of technology are steps companies in higher wage countries take to remain competitive globally. But some criticize this and mean that companies have starved themselves nearly to death. In a lot of public companies management tries to eliminate costs because it is part of their compensation package. When faced with the choice of investing in more equipment or showing a better return, executives choose short-term profits. It keeps the stock investors happy but ruins the company. The reputation of the pharmaceutical companies has been mentioned as an example of this. When deciding whether to outsource or automate and keep operations inhouse, the right answer depends on each company's answer to these questions. Does the quantity justify the expense of automating? Are the lower wages paid to foreign labor offset by the hidden costs associated with foreign operation? Is the level of skill required so precise that it's too risky to outsource the task? Are you willing to risk exposing your company's technology secrets in a country that doesn't have satisfactory protections?

To stay competitive companies are often advised to create and maintain a product that is difficult to copy. They should develop a unique competence that allows for growth. Next is to build a process within your business that allows you to make your product better than anyone else's. Also invest in capital equipment. In addition to this it is important to build an organization centered on learning and value generation. Therefore education and training are important. Ask yourself how you can provide higher levels of service at a lower cost than the competition can match. Work with your customer to ensure that you deliver your product to them as quickly as possible and as cost effectively as possible. Have equipment and people who are flexible, turn away from the old style compartmentalization and move to a flatter organization, where everyone focuses on the customer, not keeping their turf. Invest in technology that breaks down walls. For example, web sites should move beyond serving as marketing tools and allow customers to order directly and monitor the status of their order.

In short, to survive companies try with cross-training manufacturing staff, using automation and technology and outsourcing less-specialized, commodity functions. Diversifying over multiple industries are other measures that successful businesses use to solidify and grow in a globalized world. But this is not enough.

Information exchange is an integral, often overlooked, aspect of globalization. Direct foreign investment brings not only an expansion of the physical capital stock, but also technical innovation. National and international institutions influenced by differences in culture, play an important role in the process of globalization and might create tensions. Freedom of opinion therefore has to be protected against new types of commercial control and private oligopolisation and concentration.

In the future we are supposed to live on ideas, innovations and new knowledge in the knowledge society. A crucial question then becomes how to manage all these people that are supposed to produce ideas and innovations. Important is also how to manage intellectual property rights. Strengthening intellectual property rights can have monopolies raising prices and stifling innovation.

3. The Knowledge Society

The concept "the knowledge Society" has two parts, "knowledge" and "society". In the next section I will detail different ways to categorize knowledge and how I have decided to view knowledge in this book. When it comes to the word "society" the sociologist Norbert Elias

writes in one of his books "The Individualized Society" that "society, as we know, is all of us, it is a lot of people together". He continues "it only exists because a large number of people exist, it only continues to function because many individual people want and do certain things, yet its structure, its great historical transformations clearly do not depend on the intention of particular people". So we all constitute society. It exists because we exist. Still most of us have very little to say when the society we live in is transformed.

The knowledge society is a society in which its inhabitants exercise their knowledge and express themselves with the help of new information-and communication technology. It is a society that seeps through some layers of the everyday world surrounding us, but not all. The people that participate in this society, contribute to it and benefit from it, are well-educated professionals such as producers of IT, technicians and consultants. It costs to participate in the knowledge society in the form of investments in education and equipment but it also costs to not participate.

The concept "the knowledge society" was used for the first time by the American researcher Robert Lane in an article published in *The American Sociological Review*:

"As a first approximation to a definition, the knowledgeable society is one in which, more than in other societies, its members: a) inquire into the basis of their beliefs about man, nature and society, b) are guided (perhaps unconsciously) by objective standards of veridical truth, and, at upper levels of education, follow scientific rules of evidence and inference in inquiry, c) devote considerable resources to this inquiry and thus have a large store of knowledge, d) collect, organize and interpret their knowledge in a constant effort to extract meaning from it for the purposes at hand, e) employ this knowledge to illuminate (and perhaps modify) their values and goals as well as to advance them. Just as the "democratic" society has a foundation in governmental and interpersonal relations, and the "affluent society" a foundation in economics, so the knowledgeable society has its roots in epistemology and the logic of inquiry". (Lane, 1966)

The knowledge society has also been particularized as the "post-industrial society", by the researcher Daniel Bell. In this society there has been a change from a goods-producing to a service economy. The professional and the technical class play a dominating role and theoretical knowledge is central as a source of innovation and policy formulation in the society. The future orientation of society includes the control of technology and technological assessment. And decision-making is influenced by the creation of a new "intellectual technology". (1974) According to Bell the importance of the post-industrial society is that it strengthens the role of science and cognitive values as a basic institutional necessity of the society. It makes decisions more technical and brings the scientist or economist more directly into the political process. It deepens existing tendencies towards the bureaucratization of intellectual work and creates a set of strains for the traditional definitions of intellectual pursuits and values. It creates and extends a technical intelligentsia and raises at the same time crucial questions about the relationship between the technical and the literary intellectual. Bell concludes that the post-industrial society is a knowledge society:

"The post-industrial society, it is clear, is a knowledge society in a double sense: first, the sources of innovation are increasingly derivative from research and development (and more directly, there is a new relation between science and technology because of the centrality of theoretical knowledge); second, the weight of the society/measured by a larger proportion of

Gross National Product and a larger share of employment/is increasingly in the knowledge field”. (Bell, 1974)

In this society new information and communication technologies provide a distinct technological base that changes the conditions for the production, distribution and use of knowledge. These new technologies enable access to communication networks and make interaction and the exploration and analysis of the contents of gigantic databases possible. They emerged in the 1950s and took off with the introduction of the Internet during the 1990s. They can transmit written texts, pictures and music and have generated activities like e-learning, e-commerce and e-government. Now people can buy books and airline tickets, submit tax returns and even vote on the Internet. One of the people I interviewed conceptualized the knowledge society like this:

“I think about IT, I think about a society in which the individual is connected and on-line all the time. The individual has a mobile phone in his pocket, internet, e-mail. It makes people reachable 24 hours a day. It has created a society that is very demanding...the individual is exposed to a lifestyle that rarely gives time to reflect. You are supposed to take decisions all the time and on very short notice...I think that the human brain have a problem to manage all these new things...all of us become like hockeyplayers-you are terrorized from everywhere, and still you are supposed to deliver...” (The former COB of SE-banken)

I think that some of the many interesting characteristics of this society are: a) the accelerating speed at which knowledge is created, accumulated and depreciated, b) the growth of knowledge-intensive activities, c) the growth of knowledge-intensive communities, d) the increasing dependence on innovation, and finally e) the transformation of some groups of professionals into knowledge workers and the questioning of these groups in an unprecedented way that they never used to be. (David and Foray, 2002, Scarbrough, 1999) Another interviewee described his view of the knowledge society like this:

“We create new ways to work and a new way to behave. I work with industrial production. There you find a dynamic change that you do not see so much from outside but you find it inside the companies. The processes change. You get another picture of what is happening. The view of how things are done changes. For Volvo it used to take 60 months to develop a new car. Now it takes 24 months. Time is one of the most important things that we lack today. Time is probably more important than capital such as money...” (The former COO of Volvo)

A knowledge economy's growth into a knowledge society depends on the emergence of knowledge-intensive activities and communities. I conceptualize knowledge-intensive activities as activities that require a lot of scientifically based professional knowledge both of the providers and the clients / customers. This way of viewing knowledge-intensive work shows that a service like housecleaning is not at all knowledge-intensive since it requires very little knowledge based on scientific grounds on the part of both the provider and the client/customer. R&D services require in general a lot of knowledge both of the provider and the client and belong to the most knowledge-intensive activities that exist, while medical services that requires a lot of knowledge of the provider but very little of the client/patient can be found somewhere in the middle.

The ability to invent and innovate are core activities and a survival mechanism in the knowledge society. The ability to innovate often emerges from the interplay between codified knowledge and learning processes in knowledge intensive communities. Codification serves

to further memorization, communication and learning. It forms a basis for the creation of new knowledge and new ideas that then can be embodied in products, processes, organizations and people. One of the important activities in the knowledge society is therefore to codify knowledge. The goal is to articulate and clarify the knowledge of a professional man or women so that it can be expressed in a particular language and recorded on a particular medium.

A paradox in the knowledge society is the accelerating attention to systematic investigation, despite the irregularity and ad hoc-processes that is often connected to the production of “great” ideas. Science is in focus and the goal seems to be to define and categorize, manage, control and rule. Computer-terms like “up-grade” have become keywords. People do not only upgrade the software on their computer. They are also supposed to upgrade their education, themselves and maybe many other aspects of their life like their home or even their partner. Another word is “interface”. Creation of new products and ideas appear at places that are interfaces between different specialist domains at the same time as people become increasingly specialized.

To me the knowledge society is a place that includes some people and excludes others. In this society some people want to gain access to the tacit knowledge of others, codify and make it explicit but at the same time tacit knowledge is not always allowed to develop because of stress and lack of time. Moreover when someone takes the knowledge of people away and makes it explicit the individual loses status. Some people become alienated and exchangeable.

Knowledge-intensive communities

The German sociologist Ferdinand Toennies (1855-1936) classified in his book “Gemeinschaft und Gesellschaft”, published 1888, the known forms of human organization as being either community which is organic and fate or society which is structure and very largely under social control. He never talked about organizations. The word organization existed first around the second world war. They are not collectives but tools, a means to an end. Membership in an organization is always freely chosen. Knowledge workers work in teams. They have to have access to an organization. The understanding of teams, the performance capacities of different kinds of teams, their strengths, their limitations, the trade-offs between various kinds of teams, will become central concerns in the performance of people. It is the organization that can convert the specialized knowledge of the knowledge worker into performance. The knowledge society is a society of organizations in which practically every single task is being performed in and through an organization. Its central and distinctive organ is management. And the essence of management is to make knowledge productive in diverse organizational settings.

Knowledge based activities emerge when people, supported by information and communication technologies, interact to co-produce new knowledge. This involves three main elements: a significant number of a community's members combine to co-produce new knowledge, the community creates a “public” space for exchanging and circulating the knowledge and new information and communication technologies are intensively used to codify and transmit the new knowledge.

Knowledge-intensive communities can be characterized by strong knowledge production and reproduction capabilities, a public or semi-public space for learning and exchange and the intensive use of information technologies. (David and Foray, 2002) A learning space is any

forum where professional experts, ordinary users of information and uninitiated students are brought together by their shared interest in a given subject.

As an example medical doctors illustrate a key characteristic of the knowledge society, a higher frequency of information transactions between equals and colleagues that is a key characteristic of the knowledge society. Many doctors document their new clinical knowledge and make it available to others through easily accessible electronic databases. Then other practitioners can draw on or add to that pool of information, enhancing the advance of what is called evidence-based medicine.

4. A continues structuring is going on in the society

Structuration theory (1984, 1979) is one of Giddens' contributions to social theory. It is also behind what is written in this paper. I argue that there is a continues structuring of how knowledge is exercised going on in the knowledge society. The main concern of social theory is to construct and/or rework conceptions of human being and human doing, social reproduction and social transformations. In his book *"The Constitution of Society"* Giddens characterizes two major schools of sociological research: those predominantly concerned with *structure* and those predominantly concerned with *agency*. Structuralists and functionalists (Marx, Parsons, Levi Strauss) have largely given explanations of social behavior in terms of structural forces which constrain people to do things in particular ways. Other traditions in sociology (hermeneutics, phenomenology) have concentrated on the human being as the primary actor in, and interpreter of, social life. Giddens deplores and disapproves of the way these researchers focus on either social structure or the individual. Instead he tries to bridge the gap between these two in his structuration theory. Structuration theory is based on the premise that this dualism can be reconceptualized as a duality – "the duality of structure".

Structuration theory is also a constructionist theory. It holds that humans are social constructs and that their institutions of all sorts are constructs upheld by humans acting according to their images of what reality is. Giddens sees structuration as not external to the individual but as interdependent with the individual. One of the many things that Giddens tries to grasp in his theory about structuring, and the one that interests me in connection with this paper, is that our life passes in transformation and structure is more of a process than a steady-state phenomenon. At the same time, Giddens also emphasizes the routinized character of every day life. He thinks that the enactment of routines minimizes unconscious sources of anxiety in day-to-day social activity. Routinized practices are the prime expression of "the duality of structure". Proceeding from the social sciences, and what I have written above, I conclude that the basic domain of study in structuration theory, is the experience of the individual actor and *social practices*. According to Giddens social practices are accomplished by knowledgeable human agents with powers to make a difference. These agents have a capacity for self-reflection in day-to-day interaction, a practical, often 'tacit' consciousness of what they are doing and an ability under certain circumstances to do it.

However, social practices are not random and purely voluntaristic, but ordered and stable across space and time, in short routinized and recursive. In producing social practices, which make up the visible patterns which constitute society, actors draw upon "structural properties" (rules and resources) which are themselves institutionalized features of societies. Structure is therefore activity-dependent. It is both the medium and outcome of a process of "structuration" - the production and reproduction of practices across time and space. This

process is what Giddens has called the “double hermeneutic”, the double involvement of individuals and institutions. “We create society at the same time as we are created by it”. (Giddens, 1984 p. 14) I repeat that the “double hermeneutic” is Giddens conceptualization of the “mutual interpretive interplay between social science and those whose activities compose its subject matter” (Giddens, 1984 p. xxxii). He wrote that “all social actors, it can properly be said, are social theorists, who alter their theories in the light of experience” (Giddens, 1984 p. 335) _ part of which experience is social theory. All social theorists are likewise actors.

Social life may often look predictable in its course. But its predictability is in many of its aspects “made to happen” by social actors. It does not happen in spite of the reasons they have for their conduct. If the study of “unintended consequences and unacknowledged conditions of action” is a major part of social research, it is nonetheless important to stress that such consequences and conditions are always to be interpreted within the flow of intentional conduct.

In general sociology is macro (concerned with societies), or micro (concerned with the social relationships of individuals). Giddens has much to say about both, but little directly to say about organizations or groups of people which normally are the unit of analysis for a researcher of management, organization, institution or information system. When Giddens does mention them he tends to do so in a way which implies that they fall within the scope of his theory without special conditions.

“Organizations.....are collectivities in which the reflexive regulation of the conditions of system reproduction looms large in the continuity of day to day practices.” They depend on ‘the collation of information which can be controlled so as to influence the circumstances of social reproduction’ . (Giddens, 1984 p. 200)

Instead of using the word organizations Giddens uses the word systems and they are conceptualized as "patterns of relations in groupings of all kinds, from small, intimate groups, to social networks, to large organizations". (1984, p. 131) That is, it is the patterns of enacted conduct, the repeated forms of social action and interaction, or the "enduring cycles of reproduced relations" that form social systems. Systems could be families, communities, or cities, either at the face-to-face level or existing via networks over time and space. The networks associated with print or electronic communication, or occasional person-to-person meetings associated with conventions or conferences, are examples of systems that have become more common today with the development and expansion of communication and transportation.

In organizations personal knowledge can be transmitted because a set of values are learned, permitting a shared language by which to communicate. (Berger and Luckmann, 1966) This language provides a normative sanction of how activities are to be organized or what information to be collected and evaluated. Social integration then refers to face-to-face reciprocities between agents who meet in circumstances of co-presence, and therefore preserves a concern for *praxis in situ*, and system integration refers to reciprocities between absent agents, i.e. agents who are physically and/or temporally situated in different settings, which admits the possibility of inter-situational articulations of systemic patterns. (Giddens, 1984)

Agency and structure are concepts that often are widely discussed and intimately related to the debate about subjectivism and objectivism. Sewell (1992) notes that structure is actually one of the most important and most elusive terms in the vocabulary of current social science. In this study I use Giddens' conceptualization of agency and Sewell's conceptualization of structure. Agency, according to Giddens, refers not to the intentions people have of doing things but to their capability of doing those things in the first place. Agency concerns events of which an individual is the perpetrator, in the sense that the individual could, at any phase in a given sequence of conduct, have acted differently. Therefore the reflexive monitoring of activity is a chronic feature of everyday action and involves the conduct not just of the individual but also of others. This means that actors not only monitor continuously the flow of their activities and expect others to do the same. They also routinely monitor aspects, social and physical, of the contexts in which they move.

Giddens defines structure as rules and resources, recursively implicated in the reproduction of social systems. Structure exists only as virtual memory traces, the organic basis of human knowledgeability and as instantiated in action. (1984, p. 377) William Sewell (1992) criticizes Giddens definition of structure and writes that some resources cannot be virtual. Instead Sewall defines structure as "schemas with a purely virtual existence and resources are media and outcomes of the operation of structure". I use his definition since as an example material resources such as blood cannot be considered virtual since material things by definition exist in space and time. Schemas are defined by Sewell as "generalizable procedures applied in the enactment/reproduction of social life". Structure is dynamic, not static; it is the continually evolving outcome and matrix of a process of social interaction. Even the more or less perfect reproduction of structures is a temporal process that requires resourceful and innovative human conduct. But the same resourceful agency that sustains the reproduction of structures also makes possible their transformation. If resources are effects of schemas, schemas are effects of resources. Schemas not empowered or regenerated by resources would eventually be abandoned and forgotten just as resources without cultural schemas to direct their use would eventually dissipate. Sets of schemas and resources may be said to constitute structures only when they mutually imply and sustain each other over time. (Sewell, 1992)

Social systems and the structural properties of these social systems are created every day through our thinking and actions. Giddens emphasizes that it is human beings that bring structures to life. Even when we just talk we enact a structure. Structures are recognizable because repeated and recurrent. They are seen as a pattern that emerges in human relationships. This pattern shapes what people do. We learn how to do things. It is inherent in structuration theory that people create the structures that shape them and these emerge and evolve over time. What agents know about what they do, and why they do it, their knowledgeability *as* agents, is largely carried in practical consciousness. Practical consciousness consists of all the things which actors know tacitly about how to "go on" in the contexts of social life without being able to give them direct discursive expression.

Human agency, in Giddens formulation, is the "capacity to make a difference"(Giddens 1984 p. 14) - (also known as "transformative capacity"). It is intimately connected with power _ in fact this is one of its defining characteristics since the loss of the capacity to make a difference is also powerlessness. In practice, human agents almost always retain some transformational capacity - though it be small.

Giddens defines structure as: Rules and resources, recursively implicated in the reproduction of social systems. Structure exists only as virtual memory traces, the organic basis of human knowledgeability, and as instantiated in action. (1984, p. 377) William Sewell (1992) criticizes Giddens definition of structure and writes that some resources cannot be virtual. Instead Sewall defines structure as schemas with a purely virtual existence supported by resources that are the media and the outcomes of the operation of structure. Giddens uses the concept of structures to get at relations of transformation and mediation which are the “circuit switches” underlying observed conditions of system reproduction. He suggests that an explication of virtual structures requires examining actors knowledge (memory traces), their social practices (organized through the recursive mobilization of that knowledge) and the capabilities implicated in the production of their practices.

For Giddens, structure refers to practices which are structured along certain lines. These are:

- ◆ Procedural rules – how a practice is performed
- ◆ Moral rules – appropriate forms of enactment of social action
- ◆ Material resources – means of production, commodities, income, consumer and capital goods
- ◆ Resources of authority - how time and space are organized, production and reproduction, social mobility, legitimacy and authority

The value of Giddens’s systems and structures is to provide a means of bridging the structure-agency gap, focusing on systems and structures as patterns of enacted conduct. At some level we may consider these as existing apart from the individual, but if social action and interaction were to end, it is clear that social structures would no longer exist. I like that Giddens’s structures and systems seems to be dynamic and not closed, so that they can accommodate many different forms of power and social change.

Giddens writes that “in moving from the analysis of strategic conduct to a recognition of the duality of structure, we have to begin to “thread outwards” in time and space. That is to say, we have to try to see how the practices followed in a given range of contexts are embedded in wider reaches of time and space -- in brief, we have to attempt to discover their relation to institutionalized practices. (1984, p. 297-98)

Time, or the constitution of experience in time-space, is an evident feature of human day-to-day life. (Giddens, 1984) Time-space is concerned with the constraints that shape the routines of day-to-day life and put an emphasis upon the significance of the practical character of daily activities, in circumstances of co-presence, for the constitution of social conduct. Giddens defines time-space distanciation as the stretching of social systems across time-space on the basis of mechanisms of social and system integration.

Also fundamental to social life is the positioning of the body in social encounters. All social interaction is expressed at some point in and through the contextualities of bodily presence. The human body imposes limitations upon the capabilities of movement and perceptions of the human agent. The limited capability of human beings to participate in more than one task at once, coupled with the fact that every task has a duration and the fact that movement in space is also a movement in time, influences the outcome of implementing a computerized patient journal in a specific organizational setting such as in the operating room. Time-space always has a limited packing capacity. No two human bodies can occupy the same space at the same time. Giddens expresses it so that the body is positioned in the immediate

circumstances of co-presence in relation to others. Positioning is to be understood in relation to the seriality of encounters across time-space. It means that every individual is at once positioned in the flow of day-to-day life; in the life-span which is the duration of his or her existence; and in the duration of “institutional time”, the “supra-individual” structuration of social institutions. Finally, each person is positioned, in a “multiple” way, within social relations conferred by specific social identities; this is the main sphere of application of the concept of social role. The modalities of co-presence, mediated directly by the sensory properties of the body, are clearly different from social ties and forms of social interaction established with others absent in time or in space. (1984 p. xxiv-xxv)

The structuring of a specific social setting takes place as actors draw on and make sense of institutional patterns of signification, domination, and legitimation to construct roles and interpret persons, objects, and events in their environment. (Giddens, 1984) Signification has to do with what theory of coding exists. A theory of coding is the product of symbolic orders or modes of discourse. The signification structure is linked to organizational interaction by different kinds of interpretative scheme. These schemas are the cognitive means by which actors makes sense of what others say and do. Domination has to do with what theory of resource authorization, and theory of resource allocation that exists. Resource allocation and authorization is decided by economic institution and political institution. The domination structure deals with various ways of exercising power using different types of resources. Legitimation has to do with what theory of normative regulation exists and what legal institution constitutes the institutional order. The legitimation structure involves the moral constitution of interaction and is mediated through norms and moral codes which sanction particular behaviours. By **interpretative schemes** Giddens mean standardized elements of stocks of knowledge applied by actors in the production of interaction.

The diagram below shows how social structure and human interaction are broken down into three dimensions and the recursive character of these dimensions is illustrated by the linking modalities.

Structures	Signification ↔	Domination ↔	Legitimation
Modalities	↕ Interpretative schemes	Authoritative and allocative resources	↕ Norms ♦ for use ♦ for explanation
Interaction	↕ Communication ↔	Exercise of power ↔	↕ Sanctions

Basic concepts and relationships of structuration theory (Taken from Giddens, 1984)

Thus, as human actors communicate, they draw on interpretative schemes to help make sense of interactions; at the same time those interactions reproduce and modify those interpretative schemes which are embedded in social structure as meaning or signification. Similarly the facility to allocate resources is enacted in the exercise of power, and it produces and reproduces social structures of domination, and finally moral codes (norms) help determine what can be sanctioned in human interaction, an in doing so these codes iteratively produce structures of legitimation.

The study of day to day life is integral to the analysis of the reproduction of institutionalized

practices. Day-to-day life is bound up with the repetitive character of reversible time, with paths traced through time-space and associated with the constraining and enabling features of the body. Giddens treats regularized acts as situated practices. Any action that is repeated frequently by a knowledge worker in an organizational setting, like for example administering anesthesia in the operating room, becomes cast into a pattern, which can then be reproduced with an economy of effort.

A social order is created.

To create a social order around a way to work is an ongoing human production and a way to save energy. It is a way to establish a structure.

Resources are of two kinds: authoritative resources, which derive from the co-ordination of the activity of human agents, and allocative resources, which stem from control of material products or of aspects of the material world. Authoritative resources refer to types of transformative capacity generating command over persons and actors. Allocative resources refer to capabilities and to forms of transformative capacity generating command over objects, goods or material phenomena. Resources are the media whereby transformative capacity is employed as power in the routine course of social interaction; but they are at the same time structural elements of social systems as systems reconstituted through their utilization in social interaction.

All social rules (codes and norms) are transformational. To say that mental schemas are transformational is to say that they generate an indefinite range of empirical contents, which have an identity with one another only in respect to their relation to those rules. The notions of transformation and mediation apply not only to the structuring of interaction in real time-space, they are also essentially involved in analyzing structures themselves. When mediation and transformation are taken together they can be said to concern the convertibility of rules and resources. (Giddens, 1984, p. 104)

”What is especially useful for the guidance of research is the study of, first, the routinized intersections of practices which are the *”transformation points”* in structural relations and, second, the modes in which institutionalized practices connect social with system integration”. (Giddens, 1984)

Routinized practices are the prime expression of the duality of structure. In the enactment of routines people sustain a sense of ontological security. The routine (whatever is done habitually) is a basic element of day-to-day social activity. The term 'day-to-day' encapsulates exactly the routinized character which social life has as it stretches across time-space. The repetitiveness of activities which are undertaken in like manner day after day is the material grounding of what Giddens call the recursive nature of social life. Routinization is vital to the psychological mechanisms whereby a sense of trust or ontological security is sustained in the daily activities of social life.

The concept knowledge is defined by Giddens as ”memory traces” of ”how things are to be done”. (Giddens, 1979, p. 64) Giddens also points out that knowledge can be understood in terms of both practical and discursive consciousness. Practical consciousness, which is knowledge embodied in what actors “know how to do”, and discourse, what actors are able to “talk about” and in what manner or guise they are able to talk about it. (Giddens, 1979, p. 73

) Giddens thinks that knowledgeability embedded in practical consciousness exhibits an extraordinary complexity. It is a complexity that unfortunately often remains unexplored in orthodox sociological approaches, especially those associated with objectivism. Actors are always knowledgeable about the structural framework within which their conduct is carried on because they draw upon that framework in producing their action at the same time as they reconstitute it through that action. (Giddens, 1979, p. 144) The line between discursive and practical consciousness is fluctuating and permeable, both in the experience of the individual agent and as regards comparisons between actors in different contexts of social activity. (Giddens, 1984, p. 4)

Then the concept mutual knowledge stands for a non-corrigeable resource which the social analyst depends upon, as the medium of generating “valid” descriptions of social life. Mutual knowledge incorporated in encounters is not directly accessible to the consciousness of actors. Most such knowledge is inherent in the capability to go on within the routines of social life. Giddens writes that to know a form of life is to be able to participate in it.

Earlier structuration theory has not been used very often in connection with theories about knowledge management but to a certain extent in connection with information systems research, in spite of that Giddens originally considered technology only as an allocative resource. In addition to this structuration theory has often been criticized for being only a meta-theory that requires researchers to specify whatever logic that is appropriate to a specific phenomenon or contexts. Giddens response to this critique is that although structuration theory carry no particular methodological implications it “sensitizes” the researcher to particular sets of concepts (such as the relationship between action and structure) which might otherwise have been ignored. In this book I want to sensitize the reader to the importance and value of knowledge when an organizational setting is organized and structured. Few researchers, except Orlikowski (2002), have combined structuration theory with ideas about knowledge management. But she writes: “With the intensification of globalization, acceleration in the rate of change, and expansion in the use of information technology, particular attention is being focused on the opportunities and difficulties associated with sharing knowledge and transferring “best practices” within and across organizations”.

5. Knowledge as a concept

Knowledge used to be personal, a private good and contributing to an individuals status in society. In the knowledge society the aim is to make knowledge a public good, applied to doing and productive. (Drucker, 1993) Knowledge is often conceptualized as an economic resource that creates values in both society and organization. It means that we will have to redefine what it means to be an educated person. Increasingly an educated person will be someone who has learned how to learn and throughout his or her lifetime continues to learn, especially in and out of formal education.

Knowledge is often mixed up with data or information. But access to information is not the same as the capacity to render that information meaningful. Nor is information about doing something the same as knowing how to do that thing in practice. Knowledge is experience, according to Einstein. Everything else is just information. Experience is afforded a center-of-stage role. Knowledge basically exists only in application. I view knowledge as something that is exercised by a person using information and data.

In the modern literature about knowledge one can find concepts such as personal knowledge and organizational knowledge. Personal knowledge can be defined as “the individual capability to draw distinctions within a domain of action based on an appreciation of context or theory”. (Tsoukas and Vladimirou, 2001) The concept organizational knowledge can be pictured as “the capability members of an organization have developed to draw distinctions in the process of carrying out their work, in particular concrete contexts, by enacting sets of generalizations, whose application depends on historically evolved collective understandings”. (Tsoukas and Vladimirou, 2001)

Professional knowledge or intellectual capital, is another often used concept that I will write more about further down. Then there is explicit knowledge and something called tacit knowledge. (Polanyi, 1966) Explicit knowledge is knowledge that is easy to transmit or disseminate throughout an organization, such as rules, specifications and mathematical formulas. Tacit knowledge is normally constructed as a kind of knowledge that people possess but are unable to articulate, it is a form of subjective know-how that allows people to act. It is in general achieved by doing and transferred through a master-apprentice-system.

Tacit knowledge can be thought of as having two dimensions, one technical and one cognitive. The technical dimension is know-how represented in “the master craftsman” who “develops a wealth of expertise” at his fingertips, after years of experience. But he is often unable to articulate the scientific or technical principles behind what he knows. (Nonaka and Takeuchi, 1995) The cognitive dimension of tacit knowledge consists of schemata, mental models and perceptions. (Fiske and Taylor, 1991)

Blackler (1995) provides another way to categorize knowledge when he suggests that organizations depend on at least five different types of knowledge:

- ◆ Embrained knowledge: depends on conceptual skills and cognitive abilities
- ◆ Embodied knowledge: action-oriented and rooted in specific physical context
- ◆ Encultured knowledge: the process for achieving shared understanding
- ◆ Embedded knowledge: resides in systematic routines
- ◆ Encoded knowledge: information conveyed by signs and symbols

A third way to categorize organizational knowledge is provided by Choo when he proposes that organizations depend on back-ground knowledge, rule-based knowledge and cultural knowledge. Back-ground knowledge is knowledge that is part of the organizational culture and communicated through stories, metaphors, analogies, visions and mission statements. It supplies the world-view by which people in an organization understand and make sense of events, actions, objects, utterances or situations. (Choo, 1995) In an organization back-ground knowledge generates rule-based knowledge that guides action by answering three questions: What kind of situation is this? What kind of person am I or What kind of organization is this? What does a person such as I, or an organization such as this, do in a situation such as this? Cultural knowledge is a filter that helps people in an organization to place a value on certain kinds of knowledge and while also keeping out knowledge that is deemed unimportant by the dominant group in a culture or organization. Choo (1998) describes cultural knowledge as knowledge that: “Includes the assumptions and beliefs that are used to describe and explain reality, as well as the conventions and expectations that are used to assign value and significance to new information. These shared beliefs, norms and values form the framework in which organizational members construct reality, recognize the saliency of new information and evaluate alternative interpretations and actions”. (p.112)

This paper deals with what has also been called professional knowledge. A professional uses both explicit and tacit knowledge which are not only complementary, but in many ways also interdependent. Tacit knowledge or professional skill as a practice is normally not something professionals “think” about. They are too busy employing their skills to “think” about them. One can say that those skilled routines become “second nature” to the professional or the knowledge worker. The professional often operates with an intuitive feel for how to accomplish his or her work or through accumulated experience. (Davenport, Jarvenpaa, Beers, 1996) Therefore sufficiently altered routines, like implementing an information system, might introduce insecurity into the practices of a knowledge worker.

Expert performance is mediated by acquired complex skills and physiological adaptations. Extended training alters the cognitive and physiological processes of experts to a greater degree than is commonly believed possible.

Professional knowledge has been equated with the concept of intellectual capital, something that resides in people in terms of skills, expertise and experience. Intellectual capital is constructed as a combination of human capital and structural capital. Human capital is defined as the combined knowledge, skill, innovativeness, and ability of the company’s individual employees to meet the task at hand. It also includes the company’s values, culture and philosophy. Anything that people know, think, innovate or invent in an organization is human capital. This kind of capital cannot be owned by the company.

Human capital grows in two ways: 1) when the organization uses more of what people know, and 2) when more people know more that is useful to the organization.

Structural capital is what allows human capital to be packaged and used again. It is the hardware, software, databases, organizational structure, patents, trademarks and everything else of organizational capability that supports the productivity of the employees. Structural capital also includes customer capital, which is the relationships developed with key customers. Structural capital can be owned and traded. (Edvinson and Malone, 1997)

In this paper I view knowledge as an ongoing social process of construction and collective action in organizations and a cognitive capability that empowers its possessors with the capacity for physical or intellectual action. “Knowledge is the individual capability to draw distinctions within a domain of action based on an appreciation of context or theory”. (Tsoukas and Vladimirou, 2001) Knowledge can also be described as information effective in action, focused on results that are both inside and outside the person, in society and economy, or in the advancement of knowledge itself. I want to emphasize that the opinion that knowledge is embedded in practice means that it cannot be separated from an individuals engagement in exercising his or her practice.

6. A Knowledge Worker

In this paper I view a knowledge worker as a person that uses certain mental schemas when he or she makes sense of the world or a problem that demands action. He or she also uses representations when working with events and things absent in space and time. One example of this is that a picture on a paper might represent a patient, a road-system or an organization. A picture of a beach with palm trees might be a representation of the concept holidays, and so on. A knowledge worker interacts with others in an organizational setting when trying to

make sense of the world and a problem that demands action. He or she formulates ideas, thoughts and perceptions about the world in his or her head. And different cognitive styles are common for different knowledge workers. (Dervin, 1992, Taylor, 1991, Wilson, 1997) A cognitive style is the same as information processing habits that represents how a knowledge worker thinks, remembers, perceives and solves problems. Perception can be described as the process of getting to know an external object by the impression made by it on our senses. (Polanyi, 1966) For example vision has been described as an intelligent process of construction. (Hoffman, 1998) We have a tendency to “see” the time and remember with pictures. (Schacter, 1996) But at the same time we have to realize that what the observer observes, and how he or she makes sense of the world, depends on earlier experiences, knowledge and expectations. (Chalmers, 1994)

All human beings uses the physical world and others as sources of information to understand and make sense of the world and/or a specific situation. When interpreting the information before taking a decision on how to act, he or she draws on a frame and /or a particular abstract knowledge system that he or she has acquired through studying and working (Abbott, 1988). To make sense of a phenomenon means that a knowledge worker, such as a physician, can place it in a framework that is known to him or her and construct a meaning out of it. The knowledge worker recognizes what is happening because he or she may have seen it before.

“So far I have argued that sense-making is about such things as placement of items into frameworks, comprehending, redressing surprise, constructing meaning, interacting in pursuit of mutual understanding, and patterning.” (Weick, 1995, p.6)

According to Weick sense-making is about the ways people generate what they interpret. He has given following seven properties of sense-making:

1. Grounded in identity construction
2. Retrospective
3. Enactive of sensible environments
4. Social
5. Ongoing
6. Focused on and by extracted cues
7. Driven by plausibility rather than accuracy

The first property means that we construct our identities in interaction with others. At work we might be a human resource manager or a financial analyst but at home we are a mother or father. During other circumstances we are the next-door neighbor or a partner in a tennis-game. To shift among interactions is to shift among definitions of our self. We have a different identity depending on whom we interact with. And depending on who I am my definition of what is “out there” will also change.

The creation of meaning is also an attentional process, but it is attention to that which has already occurred. It is retrospective. Because the attention is directed backward from a specific point in time whatever is occurring at the moment will influence what is discovered when people glance backward. In other words, because the text to be interpreted has been forgotten and is a memory anything that affects remembering will affect the sense that is made of those memories.

The third property means that people create their own environments and these constrain their actions. If one believes change is possible he or she might act so that change takes place, but if one does not believe in change, perhaps nothing will be done to change a specific situation. Instead one's actions may subconsciously make change impossible.

The fourth property means that sense-making is never solitary because what a person does internally is dependent on others. How one makes sense of things happening depends on how others make sense of the same phenomenon. We are influenced by others but also influence others when making sense of the world around us.

Fifth, sense-making never starts at a specific moment since it is going on all the time. Even when we are sleeping it seems that we are trying to make sense of the world around us and find solutions to important problems through dreaming.

The sixth property means that extracted cues are simple, familiar structures that are seeds from which people develop a larger sense of what may be occurring. They function as a point of reference when making sense of something.

According to the last property I need to know enough about what I think to get on with my projects but no more, which means that sufficiency and plausibility have a tendency to take precedence over accuracy. "The sensible need not be sensible, and therein lies the trouble". (Weick, 1995, p. 55)

Weick also writes that words approximate the territory; they never map it perfectly. That is why sense-making among us human beings never stops. (1995, p. 107) The strength of sense-making as a perspective derives from the fact that it does not rely on accuracy and its model is not object perception. Instead sense-making is about plausibility, pragmatics, coherence, reasonableness, creation, invention and instrumentality. (Weick, 1995, p. 57) The central problem in sense-making is how to reduce or resolve ambiguity, and how to develop shared meanings so that the organization can act collectively. (Choo, 1998, p. 70) As long as a person is making sense of his or her experiences it is possible to move ahead. But from time to time this movement is blocked by the perception of a cognitive gap. This is a situation that the person is unable to make sense of. It causes stress and uncertainty. To close such a gap a person starts searching for information to make new sense of a situation and thereby be able to continue doing what he or she is doing. (Dervin, 1992) At the cognitive level, the individual's style and preferences impact on the processing of information. The person selects a source that has a high probability of providing information that will be relevant, usable and helpful. As an example a physician often asks a trusted colleague if the needed information is not available. At the affective level people use information selectively, for example if they want to avoid conflict or embarrassment or support their own decisions. Personal motivation and interest in the problem also determine the amount of energy that the person invests in information seeking. At the situational level the selection and use of sources is influenced by the amount of time and effort that is required to locate or contact the source and to interact with the source to get the information needed. (Dervin, 1992, Taylor, 1991, Wilson, 1997)

6.1 Representations

In addition to the processes described above, a human being uses sound, gestures or symbols that stand for or refer to objects, things and concepts in his or her working or private life. In other words they use representations. A representational system has two essential ingredients: (1) the represented world: that which is represented; (2) the representing world, a set of symbols, each standing for something in the represented world. When we think we create a symbolic representation of the world which is a picture of the world that is separate from the world itself. Representations are important because they allow human beings to work with events and things absent in space and time, or events and things that never existed such as imaginary objects and concepts. Representations that can be part of a workspace shared with others, require some sort of constructed device to support them: an artifact. For example, a map of Sweden is a social construction but it is also a representation of the concept Sweden. It might be used during a discussion of how to improve the road system or how the population is diffused over the country. The ideal is to develop representations that capture the important, critical features of the represented world while ignoring the irrelevant. It is important that they are appropriate for the task, enhancing the ability to make judgments, and to discover relevant regularities and structures. (Norman, 1993, p. 52) Representations that match our perceptual capabilities are simpler and easier to use than those that require reflection. Under a heavy work load, stress, danger and time pressure representations that require reflection are not used as rapidly and efficiently as those that can be used through simple perceptual comparisons.

6.2 Schema-use

To orient him or herself in an informational context a human being also uses mental schemas developed in a specific organizational setting. (Giddens, 1984, Fiske and Taylor, 1991) A schema influences the encoding (interpreting and taking in) of new information, memory of old information and inferences about missing information. (Fiske and Taylor, 1991, p.117) It is a way of organizing information about the world relevant to a particular task and can be described as a filtering mechanism. A schema is a cognitive structure that represents knowledge about a concept or type of stimulus, including its attributes and the relations among those attributes. It facilitates top-down, conceptually driven, or theory-driven processes, which means processes that are influenced by prior knowledge. A mental schema makes it easier for a person to make sense of a situation and decide how to act.

There are interpretative schemas, person schemas, self-schemas, role schemas and event schemas. Interpretative schemas are influenced by the shared understanding of a group of people about a phenomenon. A physician within a certain specialist domain are socialized in how to interpret certain situations and solve certain problems. When doing that he plays the role of a physician. He acts out the role schema of being a doctor. Event schemas describe appropriate sequences of events in well-known situations. One example of this is how a person learns how to get on the bus or to ride the subway. People can also have “place schemas” for particular kinds of locations. One example of this is how a surgeon learns how to move around in a certain way in the operating room of a hospital. Categories and mental schemas allow us some sense of prediction and control, which is essential to our well-being. They save energy. And they make us believe that we understand the world. Stable mental schemas lend a sense of order, structure and coherence to social stimuli that otherwise might be too complex and overwhelming to make sense of.

Mental schemas are difficult to change.

People ignore exceptions to the schema, they even interpret the exception as proving the schema. Many of the information-processing advantages of schemas would be lost if they changed at each encounter with slightly discrepant information. But having an incorrect schema is also costly since it can make people inadequate problem solvers. The wrong schema can lead one to be inaccurate, biasing encoding, memory, and inference. But nevertheless schemas are believed to be cognitively more efficient than understanding each instance afresh. (Fiske and Taylor, 1991, p.176)

A knowledge worker acts in a certain context. For Giddens context involves the following: (a) the time-space boundaries (usually having symbolic or physical markers) around interaction strips; (b) the co-presence of actors, making possible the visibility of a diversity of facial expressions, bodily gestures, linguistic and other media of communication; (c) awareness and use of these phenomenon reflexively to influence or control the flow of interaction. Social identities, and the position-practice relations associated with them, are “markers” in the virtual time-space of structure. They are associated with normative rights, obligations and sanctions which, within specific collectivities, form roles.

According to Giddens actors employ typified schemes in the course of their daily activities to negotiate routinely the situations of social life. Knowledge of procedure or mastery of the techniques of doing social activity is methodological. That is to say such knowledge does not specify all the situations which an actor might meet with. It provides for a generalized capacity to respond to and influence an indeterminate range of social circumstances.

Giddens use the concept rules and say that they can be intensive, tacit, informal and weakly sanctioned. Rules can also be shallow which means discursive, formalized and strongly sanctioned. He thinks that the structuring qualities of rules can be studied in respect of the forming, sustaining, termination and reforming of encounters. (Giddens, 1984, p. 22-23) As I read Giddens these encounters concern meetings between people. But in this thesis I focus on the meeting between new technology and people that exercise knowledge in a specific organizational setting. I’m interested of how a new technology re-structures what takes place in this setting. Both technology and knowledge can be looked at as resources, but knowledge can also partly be said to consist of rules for how to do things. These rules are also related to interpretative schemes that develop for how to perform certain tasks. Since I do not use Giddens definition of structure as rules and resource but Sewell’s definition that structure are schemes and resources, I will look at the exercise of knowledge as exercising certain mental schemes supported by certain resources.

In my research I include knowledge in Giddens model as a phenomenon that structure and gets structured. I view both technology and knowledge as a source for social structure, and as consisting of sets of schemes supported by certain resources. (Sewell, 1992) Knowledge is part of the structure as mental schemes for how to perform a practice. The signification structure in an organizational setting is linked to the interaction that takes place by different kinds of interpretative schemes. This means that an anesthetist applies a certain amount of knowledge and talk about his or her work in a special way and use certain mental schemes when evaluating situations and taking decisions about how to act. The transfer of knowledge from an individual to a group of people often also occur through the development of a unique language or code which allows group members to learn who knows what and coordinate their activities. This language, code, mental schemes, knowledge frames or thoughtstyle, influences and is influenced by what takes place in an organizational setting. I have already written that interpretative schemes make people know how to do things, in this case evaluating the patient.

It is also easier to integrate knowledge among a group of people using shared metaphors and logos and a common language. As an example tacit knowledge is more easily shared and externalized through a dialogue that uses metaphors and analogies.

So when exercising knowledge, actors mobilize the existing knowledge in a specific setting to improve a work situation. Here mastery can be described as a generalized capacity to influence a range of social circumstances related to a specific worksituation. Experimenting and prototyping might transform the existing mental schemes and build new capabilities. I view this as a sort of learning that takes place in connection to a project such as in this thesis.

Power is considered as one of several primary concepts of social science, all clustered around the relations of action and structure. Giddens writes that power is the means of getting things done and, as such, directly implied in human action. It is a mistake to treat power as inherently creating discord, but there is no doubt that some of the most bitter conflicts in social life are accurately seen as “power struggles”. Such struggles have to do with efforts to subdivide resources which yield modalities of control in social systems. By “control” Giddens means the capability that some actors, groups or types of actors have of influencing the circumstances of action of others. The domination structure in an organizational setting deals with various ways of exercising power using different types of resources, in this case knowledge. I believe that what and how knowledge gets codified in a setting depends on how the domination structure looks. Authoritative resources refer to a transformative capacity generating command over people. Giddens thinks that resources, such as knowledge, are the media whereby this transformative capacity is employed as power in the routine course of social action. He writes that the routinized intersections of practices are the transformation points in structural relations and the modes in which institutionalized practices connect social with system integration. Giddens emphasizes that routinization is vital to the psychological mechanisms whereby trust is sustained in the daily activities of social life. Care or trust is also one of the key enabling conditions for a knowledge creation process. (Von Krogh, 2000) In a situation with no care or trust, there will be no creation or transfer of new knowledge.

Now the concern in research is the interplay of people with technology—the structure of human-computer interaction, the structure of systems design and use and the possibilities for somehow improving the human condition through applications of information technology to society. In a field such as IT often dominated by technical considerations, any informed account of social practices is supposed to and helps to redress the balance. Insight and a richer understanding of social action obtained by theorizing and analysis may also pass into the store of “mutual knowledge” that informs and develops IS practice. In response to this development Walsham (1995) has advocated “multilevel” research covering influences at the level of society, organization, and individual. There is also an awareness today that there are inter-linkages in the change process among technology components, individual actions, groups, organizations and larger social activities. The value of structuration theory is that it can accommodate all these multiple perspectives, possibilities and levels of analysis.

7.The challenging practice of managing knowledge

Efforts of trying to manage knowledge in organizations and society have generated theories and ideas about a practice called “knowledge management”. People who participate in this discourse, such as researchers, consultants, human resource managers and suppliers of new information technology, investigate and discuss whether it is possible to manage knowledge, how to do so and the outcome of such efforts.

The development of the concept “knowledge management” is based on a view of knowledge as an economic resource in the knowledge society. (Swan, Scarbrough, 2001) If knowledge is a critical resource and a source of competitive advantage it must be managed more efficiently. Knowledge management has grown out of earlier research about information management and organizational learning. Information management can be described as the management of information resources, the information of management tools and technologies, or the management of information policies and standards. (Choo, 1998, p. 260) Organizational learning focused on people and human resource management while knowledge management is supposed to be something more. It is supposed to improve “factors that lead to superior performance: organizational creativity, operational effectiveness, and quality of products and services”. (Wiig, 1993)

Knowledge management had totally replaced organizational learning as a perspective used in scientific papers around 1997. (Scarbrough, Swan, 2001) At the same time information systems, which were originally concerned with the processing of data and information, were beginning to be applied to support knowledge activities in organizations.

In this paper I look at knowledge management as “the dynamic process of turning an unreflective practice into a reflective one by elucidating the rules guiding the practice, by helping to give a particular shape to collective understandings and by facilitating the emergence of heuristic knowledge”. (Tsoukas and Vladimirov, 2001) If you do that you get a possibility to implement new tools and processes or improve the one’s that exist.

Since the basis for most knowledge management activities is the idea of taking advantage of new information technology that perspective is taken for granted in this book. In addition a social and cognitive perspective is also necessary when studying knowledge management projects. This is because I view information technology as socially constructed in interactions between people, and between people and the institutions governing their every day working life. “Technology like science, involves process as well as product. In short both scientific facts and technological artifacts are to be understood as social constructs”. (Woolgar, 1987) The implication of this is that different actors engage in different strategies in an organizational setting to shape a technology according to their own plan. To understand why a technology looks as it does, one has to study what this process looks like, what happened and why.

It is also necessary to give greater emphasis to micro-processes such as cognitive processes, concept formation and thinking. (Lane, 1966) The cognitive perspective taken on knowledge management is based on a realization that human beings can concentrate on and attend to a limited number of activities since we have cognitive limits. One way to reduce the effects of this limitation is to eliminate distractions and make some activities automatic. I believe that adding, taking away or redesigning work tasks are important activities when trying to manage how knowledge is exercised in everyday work-life.

Others think that the value of knowledge management is limited since it implies control of processes that may be uncontrollable or stifled by heavy-handed direction. (von Krogh, et al, 2000) At the very least management have to realize that there are both individual and organizational barriers to managing knowledge. Typical obstacles are “knowledge as power” and few rewards for sharing knowledge. Sometimes individuals feel threatened and do not want to share their experiences and knowledge. Sometimes individuals do not want to

contribute insight and knowledge if they feel that they don't get anything back. Trust is therefore considered an important element when trying to communicate and share knowledge within organizations. Organizations also need a language, organizational stories, procedures and paradigms that allow creation and transfer of knowledge to take place. (von Krogh, et al 2000)

One can look at knowledge management as a way to improve management of the intellectual assets of an organization. (Edvinson and Malone, 1997) One can also look at knowledge management as the art of creating value from an organizations intangible assets. (Sveiby, 1999) I have already written that in this book I view knowledge management as “the dynamic process of turning an unreflective practice into a reflective one by elucidating the rules guiding the activities of the practice, by helping to give a particular shape to collective understandings and by facilitating the emergence of heuristic knowledge”. (Tsoukas and Vladimirou, 2001) I also view knowledge management as an effort to improve the ways a knowledge worker exercises his or her knowledge so that more value is created in both society and organizations.

7.1 Other ways to approach knowledge management

Other ways to approach the practice of managing knowledge is: KM as extended library (information exchange), KM as community (sharing of ideas), KM as normative control (prescribed interpretations) and KM as enacted blueprints (templates for action). (Alvesson and Kärreman, 2001) These are four distinctive orientations arranged along the dimensions of the medium of interaction and the mode of managerial intervention.

1) The first one involves extensive use of databases, advanced search systems and sophisticated communication systems. Here KM is basically a process run by a central agency responsible for the compiling, synthesizing and integrating idiosyncratic work and project experiences. Motives may be quicker or better work and support for those that need the information.

2) Knowledge management as community is often grounded in an interest in the existence of tacit knowledge. Then management is a matter of coping with diversity and encouraging knowledge sharing through influencing the workplace climate.

3) Knowledge management as normative control can be viewed as an attempt by management to exercise normative control through efforts to build and maintain a feeling of a distinct corporate identity with which employees can identify, and the downplaying of differentiation markers such as sub-organizational boundaries and status symbols, may support experiences of community across the organization.

4) The last type of knowledge management activity tries to engineer environments and control individuals at a level closer to behavior than to values or ideas. Then the aim of knowledge management is to provide templates and guidelines that produce the wanted action.

7.2 Five different objectives with knowledge management

♦ One objective with a KM-project can be to create knowledge repositories to store codified knowledge. Then the strategy for managing knowledge focuses on the computer. Knowledge

is carefully codified and stored in databases. There it can be accessed and used by anyone in the organization.

◆ Another objective can be to provide access to tacit knowledge and facilitate its transfer between individuals. As long as tacit knowledge or skills remains the property of individuals the organization is limited in its ability to amplify that knowledge to gain economies of scale or strategic advantage. Knowledge is closely tied to the person who developed it and shared mainly through direct person to person contacts. The chief purpose of computers at such companies is to help people communicate knowledge, not store it.

◆ A third type of project can focus on establishing a rich and generous environment that encourages creation, transfer and use of knowledge.

◆ A fourth type of knowledge management project might focus on managing knowledge as an asset. One approach to this way of thinking involves measuring the value of intellectual assets in the organization and including this information in financial statements.

Three key components are therefore to identify, capture and share intellectual assets. The identification of intellectual assets can be done through knowledge audits. The goal is to locate and map knowledge in the organization. What knowledge is needed? Where does that knowledge reside? What form is it in? To capture intellectual assets is the way in which knowledge is stored or held, in a reusable format, for future use. This is not only technological formats, but includes the narratives and corporate folklore told by members of the organization. To share the intellectual assets is one way in which knowledge is disseminated and leveraged throughout the organization. The combination of ideas and knowledge in the sharing stage can create new knowledge for individuals, groups and the organization. Sharing of knowledge includes organizing, accessing and utilizing knowledge.

◆ Finally one can also link the management of knowledge with organizational innovation. (Brown and Duguid, 1991; Swan et al.,1999 a; Swan and Newell, 2000)

7.3 Three different perspectives on knowledge management

Knowledge can be managed with an IT, a cognitive or a social perspective or a combination of these depending on what stance the knowledge manager or the researcher takes.

◆ The IT perspective focuses on the technology in itself, the internet, intranets, databases and how to build and implement them. The exploration of information and communication technology as a means of supporting the management of knowledge is a common research topic. (Boland Jr and Tenkasi, 1995; Alavi& Leidner, 1999; Scarbrough et al., 1999; Swan et al.,1999 a) And there is an interest within computing, engineering and industrial communities in developing and using increasingly complex knowledge management systems (Swan et al., 1999 a; Swan et al.,1999 b) This perspective accounts for approximately 70 percent of the themes discussed in KM articles in 1998 while social issues in general were neglected.(Scarbrough, Swan, 2001)

In 2 000 the Conference Board in New York published a report called “Beyond Knowledge Management: New Ways to Work and Learn”. What the Conference Board advocate with the expression “beyond knowledge management” is a focus on both IT and human resource management which means that both a social and cognitive perspective on knowledge

management is needed. This is because as the role of an information system evolves from the processing of data to the support of knowledge-based work there will be a need to integrate the technical system of the firm or the organization not only with the social system, but also with the specific “knowledge system” that characterizes the knowledge worker. (Abbott, 1988)

◆ The social perspective recognizes that the processes and practices of knowledge management are social and political. It has grown out of earlier studies about IT and organizational change based on theories about organizational politics, organizational culture, institutional theory and/or organizational learning. In each, organizational change is seen as a process in which transformative actions must overcome persistent structures and in which information technology can support the forces of either persistence or transformation, or both at the same time. This means that changes in organizations can be met by political opposition, cultural drag, institutional inertia, or organizational remembering but new organizational forms may appear nevertheless. (Robey and Boudreau, 1999)

In theories about organizational politics researchers pay attention to opposing interests of those promoting a particular change and those opposing it. (Markus, 1983, Zuboff, 1988) An information system can be viewed as part of politics at a work place and looked at as a gift or a punishment. It can be looked at as a tool for power and an attempt to direct or influence the behavior of other people. A few studies, like Davies and Mitchell (1994), have used Foucault’s ideas about power and knowledge when researching implications of new information technology. They analyzed how IT was prevented from becoming a significant factor in transforming an organization because of its definition as a knowledge object had shown it to be tied to supporting the status quo.

Within studies dealing with organizational culture the following three perspectives have been dominant: from an integrative perspective culture forms the glue that holds the organization together and helps to define its distinctive features; from a differentiation perspective, the organization is seen as a collection of subcultures. Depending on one’s sub-cultural identification technology may acquire different significance and meaning and provoke ambiguity. Finally from a fragmentation perspective ambiguity and contradiction are seen to be the pervasive and inevitable essence of culture.

Both Kling and Iacono (1989) and Kling and Scacchi (1982) focus on the persistence of organizational structures when implementing new information technology, otherwise very few studies about information systems have used institutional theories that tries to explain why organizational structures and values endure even in the face of strong efforts to change them. Kling and Iacono (1989) claim that information systems may take on institutional characteristics themselves and resist change in spite of clear advantages of upgrades and modification.

◆ The cognitive perspective on knowledge management concerns the cognitive basis and the nature of knowledge worker’s expertise and knowledge. It is based on a realization that human beings have a limited ability to take in and use information and act. This originates in earlier studies about IT and organizational change based on theories about organizational learning and research in cognitive organization theory. For an overview of this research see Björkegren (1989) Löwstedt, (1989) and Hellgren & Löwstedt. (1997)

7.4 Different dimensions of knowledge management

This book is based on an interest for knowledge management as a way to create values in organizations and society. The practice of managing knowledge may consist of intra-organizational and/ or inter-organizational activities. It means that knowledge management might take place within an organization but also between organizations. Here I sort the practice of managing knowledge into the six following categories: mobilizing knowledge, codifying knowledge, creating knowledge, converting knowledge, building knowledge and linking knowledge. Some of these are inter-related, and the key-component in several is to codify tacit knowledge and make it explicit.

a) Mobilizing

When mobilizing internal knowledge, information processes are managed to promote the sharing of information, conversion of tacit knowledge, experimenting and prototyping and the migration of knowledge to other parts of the organization. The transfer of knowledge from an individual to a group level might for example occur through the development of a unique language or code which allow group members to learn who knows what and then coordinate their activities. A person that develops soft-ware might find a solution to a problem he is working on. When he communicates this solution to his colleagues he uses a language including certain words and expressions that they all understand. He doesn't have to explain what he means with these words. His colleagues understand anyway. But before it is possible to mobilize knowledge in an organization one has to investigate and make visible what kind of knowledge that exists, and this can be done through knowledge-audits organized by management. There are three critical factors in knowledge integration: shared experiences, shared symbolism captured in metaphors and logos, and shared artifacts. The effectiveness of integration mechanisms depends on, as I have already concluded, the existence of common knowledge, including the existence of a common language and other forms of symbolic communication, the commonality of specialized knowledge, shared meaning and the recognition of individual knowledge domains.

b) Codification

Professional and specialist knowledge is a matter of both formal education based on scientific knowledge and skills. (Abbott, 1988, Janik, 1994) A professional has the same education as others in the same field but there are better and worse professionals. The difference lies in their capacity to learn from their experience and to acquire "tacit" knowledge. Tacit knowledge consists, among other things, of search rules, or heuristics, that identify a problem and the elements consisting of the solution. (Polanyi, 1966, p. 23-24) The key to innovation in the knowledge society is in unlocking the personal, tacit knowledge of the organization's members. But many cognitive capabilities are not so easy to articulate explicitly or transfer to others.

"What has become decisive for the organization of decisions and the direction of change is the centrality of theoretical knowledge _ the primacy of theory over empiricism and the codification of knowledge into abstract systems of symbols that, as in any axiomatic system, can be used to illuminate many different and varied areas of experience". (Bell, 1973, p. 38)

Knowledge reproduction has long depended on the "master-apprentice" system or inter-personal transactions among members of the same profession or community of practice.

These means of reproducing knowledge still remain at the heart of many professions, but they can easily fail to operate when social ties or contact is broken between older and younger generations and when professional communities lose their capacity to act in stabilizing, preserving and transmitting knowledge. Then reproduction stops and the knowledge in question is in danger of being lost. Codification that involves the exteriorization of memory might be a solution to this problem. This means that knowledge is detached from the individual, and the memory and communication capacity created is made independent of human beings, at least as long as the medium upon which the knowledge is stored is safeguarded and the language in which it is expressed is remembered.

Codification consists in translating knowledge into symbolic representations so that it can be stored on a particular medium. Choo (1998) writes: “Drawing out tacit knowledge requires taking a mental leap, and often involves the creative use of a metaphor or analogy.”

Here advances in information technology-based recording methods are crucial, for they allow representations of knowledge to progress from a “preliterate” stage with gestures and words, to the “literate” with writing and drawing, and then to “post-literate” stages of modeling structured interactions. But what is expressed and recorded is not complete knowledge. It is more of a learning program that helps to stabilize and reproduce knowledge. (David and Foray, 2002) In more complex cases the codified knowledge will provide only partial assistance. Knowledge reproduction will then occur through training, practice and simulation techniques, as is the case for pilots and surgeons.

c) Knowledge creation

Knowledge creation is stimulated by a situation that identifies gaps in the existing knowledge of the organization. Such gaps stand in the way of solving a technical or task-related problem, designing a new product or service, or taking advantage of an opportunity. Choo (1998) uses a general metaphor for knowledge creation that is “ looking across many levels”. It means that new knowledge is created by sharing and shifting knowledge across many organizational levels, including individuals, groups and other organizations. Knowledge creation is also achieved through a recognition of the synergistic relationship between tacit and explicit knowledge and through the design of social processes that create new knowledge by converting tacit knowledge into explicit knowledge.

Nonaka and Takeuchi (1995) propose a model in which the knowledge-creation process in an organization develops through the following five phases: sharing tacit knowledge, creating concepts, justifying concepts, building an archetype and cross-leveling knowledge. The knowledge creation takes place when team-based concepts are combined with existing data and explicit knowledge.

New knowledge is also always the outcome of the continuous interaction between cultural, tacit and explicit knowledge. Cultural knowledge supplies the assumptions and beliefs with which people explain reality and recognize the importance or value of new knowledge. Tacit informal knowledge often provides the creative impetus that drives the beginning of a new idea or concept, whereas explicit formal knowledge is in a form that can be tested and implemented in models or prototypes. The results of knowledge creation are new innovations or an expansion of the organizations capabilities. It is interesting that von Krogh (2000) argues that care is one of the key enabling conditions for knowledge creation processes. He identified five dimensions of behavior in relationships that emphasized care: mutual trust,

active empathy, access to help, lenience in judgment and courage. He believed that low care organizations have difficulty in knowledge integration/creation processes especially with respect to tacit knowledge. In such organizations individuals are likely to try to retain as much knowledge as possible for themselves and the common form of knowledge exchange will be transactional. In high care knowledge creation processes, individuals will share their knowledge, and the common form of knowledge exchange will be indwelling which involves joint commitment. A norm such as “the patient comes first” is one example of a norm or a principle that motivates a medical collective to perform as good as possible and share knowledge among themselves. This norm can be described as a motivating principle that is indwelling.

d) Knowledge conversion

Knowledge conversion in an organization starts with an individual. The first stage is socialization, which is where tacit knowledge starts its path towards becoming explicit as it is communicated outward. The second stage is externalization, where the tacit knowledge becomes explicit within the organization. A third stage is combination. During combination the explicit knowledge is individually internalized based on the relative context of that person's own knowledge and beliefs. The final stage in knowledge conversion is internalization. This is where the individual creates new tacit knowledge by reassembling explicit knowledge. During knowledge conversion the organization continuously creates new knowledge through conversions between the personal, tacit knowledge of individuals who develop creative insight and the shared, explicit knowledge by which the organization develops new products and innovation. Tacit knowledge is shared and externalized through a dialogue that uses metaphors and analogies. New concepts are created, justified and evaluated according to their fit with organizational intentions. They are tested and elaborated by building archetypes or prototypes. Finally concepts which have been created, justified, and modeled are moved to other levels of the organization to generate new cycles of knowledge creation.

e) Knowledge building

Leonard Barton (1995) suggest the following knowledge building activities: shared problem solving, experimenting and prototyping, implementing and integrating new processes and tools, and importing knowledge from outside. When it comes to the last activity he distinguish between external knowledge that is technical in nature and knowledge about the market. The key to importing technological knowledge is for the organization to expand its absorptive capacity by scanning broadly and continuously for technical opportunity and by identifying employees who can act as technological gatekeepers. Knowledge about the market might generate new products. This is a challenge when the technological potential outstrips users ability to understand it. During the activity of shared problem solving, employees with different specializations and problem-solving approaches are brought together so that the diversity of their knowledge and background can be channeled toward creative problem solving. Diversity is an important and widely discussed concept. But in real life it often seems difficult to achieve diversity in groups and organizations. As people become highly skilled they develop individual “signature skills”, which are formed from their specialization, cognitive style preferences, and preferences for particular tools or methods. Bringing all these people with diverse signature skills together to work on a problem often generates an environment that can be fertile for innovations. When integrating and implementing new methods and tools proprietary knowledge is introduced along with process tools and methods

that improve internal operation. To ensure successful implementation, user involvement is essential in these projects since the future users of the tool will have critical information that must be integrated during design. Through the activity of experimenting and prototyping the organization extends its existing capabilities as well as building new capabilities for the future. And "intelligent failures" often provide valuable lessons. Both technical knowledge and knowledge about the market can be imported to enhance the innovative capabilities of the organization.

f) Knowledge linking

The strategic knowledge of any organization lies in its long-term, knowledge-generating capabilities, which it has built up over time. These capabilities are the result of the quality of its internal network of people, skills, communications, information resources, cultural norms and the quality of its external network of relationships with customers, suppliers, distributors, information sources, and other associates. These networks are not always easy to build and they are definitely not easy to keep alive. Knowledge-linking (Badaracco, 1991) between organizations is another way to work to acquire new knowledge. Knowledge-links are defined by four traits. First the central objectives of knowledge links are learning and creating knowledge. This may be contrasted with product links, where the main goal is to provide access to a new product or open up to wider distribution of an existing product. Second, knowledge links are more intimate than product links since they require relations between people who have a stake in what happens. Third, knowledge links can be established with a wide range of partners not necessarily within the same industry. Fourth, knowledge links have a greater strategic potential than product links. Knowledge links can extend or enhance an organization's basic capability whereas product links tend to be more tactical allowing the organization to catch up or defend its position. In knowledge linking the organization forms intimate learning alliances with other organizations in order to transfer knowledge that is embedded in the specialized relationships, work cultures and operating styles of the partner organization. The goal is to enhance the knowledge-density of the networks. The creation of knowledge is no longer the activity of an organization working in isolation, but the collaborative result of its members working closely in internal groups and in partnership with other organizations.

Four conditions are often necessary for the exchange and combination of knowledge or intellectual capital. 1) The opportunity to make the exchange and combination must exist. 2) Parties involved in the exchange and combination must expect some value from the exchange. 3) Parties involved in the exchange and combination will be able to appropriate or realize some of the new value created by the engagement. 4) The capability to combine information or experience must exist.

But the migration of knowledge between organizations continues to pose many challenges. Inter-organizational collaborations depend on the alliance or the governance structure of the agreement between the partners. Equity joint ventures will lead to a higher degree of knowledge sharing than contract-based alliances. In a project that both parties have invested money they are probably more likely to share knowledge compared to in a project that is loosely put together and formalized by a few words on a paper. Then the internal capabilities, nature of knowledge, collaborative strategy, bargaining powers, management processes and network structure of the partners influences the outcome of knowledge linking. A significant amount of knowledge is still being transacted in the form of specific pieces of equipment,

software, blueprints, documents and the like. Such prefabricated knowledge tends to have short life spans and is often exchanged for operational or tactical reasons.

8. Knowledge structuring

I always emphasize that exercising knowledge is a structured activity. In our heads we always make plans for what to do, how to do it and what to do next. When an organizational setting is structured the knowledge that is exercised in this setting also becomes structured.

In the knowledge society the aim is to get access to the knowledge of a specialist, not making it person-dependent. Codifying knowledge, trying to make it explicit and store it on a medium to make it available to others, is considered a core activity. But to me it is obvious that codifying knowledge also implies a structuring of knowledge. To codify knowledge means to make visible how a knowledge worker does what he or she does. The different elements of an act of knowledge are made visible and organized in a certain order.

There are many advantages with this structuring. But there is also a tacit dimension to all knowledge, according to Polanyi. We know more than we can tell. (Polanyi, 1966) Lyotard also writes that true knowledge is always indirect knowledge. (1979 / 1984) Tacit knowledge is learned through experiencing and doing a task, during which the individual develops a feel for and capacity to make intuitive judgments about the successful execution of the activity.

“Our body is the ultimate instrument of all our external knowledge, whether intellectual or practical. In all our waking moments we are relying on our awareness of contacts of our body with things outside for attending to these things. (Polanyi, 1966)

I always write that it is important to realize that what is expressed and recorded when codifying knowledge is not complete knowledge since knowledge is in “the body” of the knowledge worker. What is recorded is more of a learning program that helps to stabilize and reproduce knowledge. (David and Foray, 2002) I conceptualize what can not be made explicit as “pseudo-tacit knowledge”. It is pretended tacit knowledge. The knowledge that is embedded in a person and how she or he feels, smell and see can never be made explicit. Tacit knowledge is knowing procedure while pseudo-tacit knowledge is depending on personality, and an ability to unlearn. Polanyi thinks it is contraproductive to even try to believe that it is possible to formalize knowledge.

“I think I can show that the process of formalizing all knowledge to the exclusion of any tacit knowing is self-defeating. (Polanyi, 1966)

It is also evident that in most cases the codified knowledge provides only partial assistance. Knowledge reproduction will then occur through training, practice and simulation techniques. Another example of this is a recipe in a cook-book. All the ingredients are listed and instructions for how to prepare the course. But to be a successful chef demands something more, it demands a “feeling” for how to make a meal delicious. A third example is reading notes and performing music. Most people can learn how to read notes and play a waltz by Chopin on piano. But do do it beautifully craves something more that is not so easily expressed in words. It is the same with performing surgery or anesthesia. You have to have a “feeling” for what you do and get “ it” into your hands, according to the employees. As a response to the somewhat naïve aim today to formalize and make knowledge explicit one can read Polanyi:

“But suppose that tacit thought forms an indispensable part of all knowledge, then the ideal of eliminating all personal elements of knowledge would, in effect, aim at the destruction of all knowledge”. (1966)

I apply the concept knowledge structuring to a phenomenon that I think needs to be explored further. For me one important question is if more structured also means more rigid. Another question is how to find a balance between control and creativity when working with knowledge management activities.

9. Knowledge domination

Giddens writes that in an administered society is centralized control of “knowledge” or “information” a medium of domination. (1979, p.162) In this section I want to emphasize that it is not self-evident that the outcome of knowledge management activities depend on management or some kind of central force, but rather on who dominates over knowledge, the most important resource when creating values in professional organizations and society. Giddens (1984, 1979) treats resources as the vehicles of power. He writes that political and economic domination of resources are underlying the structuring of a setting. (1984) I want to add domination related to different kinds of affections and emotions as important when it comes to an idiosyncratic resource such as knowledge.

Power can be conceptualized as “ the capacity to achieve outcomes...to make a difference”. (Giddens, 1984) But at the same time Giddens thinks that it is a mistake to treat power itself as a resource, as many theorists of power do. Instead resources, in this case knowledge, are the media through which power is exercised and structures of domination reproduced. (Giddens, 1979, p. 91) Today the individual often experiences feelings of powerlessness in relation to a diverse and large-scale social universe. Time-space distanciation and the deskilling effects of abstract systems are the two most important influences. (Giddens, 1991) Then the individual’s sense of ontological security can be achieved through a fantasy of dominance. The next step is that this fantasy is acted out.

So, how a knowledge worker exercises his or her knowledge is influenced by feelings and thoughts. Management might try to target the minds of the knowledge worker through influencing values och norms. But authority can be problematic. The essential characteristic of authority is the general approval and acceptance of those over whom it is exercised. If they don’t accept the authority of management they might negatively influence what takes place in this organizational setting. Since knowledge is embedded in practice it is the person who exercises the knowledge that dominates over how the knowledge is exercised. Also making tacit knowledge explicit takes place during collective reflection, but during reflection someone dominates over the course of the negotiations that takes place. I therefore propose the concept knowledge domination as a perspective to think about and further investigate and analyze the outcome of efforts of trying to manage knowledge.

The concept “knowledge management” is based on the view of knowledge as an economic resource. (Swan, Scarbrough, 2001) If knowledge is a critical resource and a source of competitive advantage it must be managed more efficiently. One underlying assumption of knowledge management is that knowledge is a resource that can be managed. But some also point at the contradiction between the words knowledge and management. If knowledge is “an ambiguous phenomena, intrinsically related to meaning, understanding and process”, then

it is not possible to manage. (Alvesson and Kärreman, 2001) Others also think that the value of knowledge management is limited since it implies control of processes that may be uncontrollable or stifled by heavy-handed direction. (von Krogh, et al, 2000) At least there are both individual and organizational barriers to managing knowledge. Typical obstacles are “knowledge as power” and when there are few rewards for sharing knowledge. Sometimes individuals feel threatened and do not want to share their experiences and knowledge. Trust is an important element when trying to communicate and share knowledge within organizations. Von Krogh (2000) also argues that care is one of the key enabling conditions for knowledge creation processes.

One assumption underlying my concept “knowledge domination” is that knowledge is localized and embedded in practice. Someone governs over knowledge, the mental schemas that are enacted and the resources used, when exercising knowledge. Domination occurs when the structured asymmetries of resources are drawn upon and reconstituted in power relations. When it comes to a resource such as knowledge this is an extra sensitive issue. An employee might know more about something than management but keep it to himself if he doesn’t gain something from contributing his knowledge. Giddens writes that information storage is a fundamental phenomenon permitting time-space distancing and a thread that ties together various sorts of allocative and authoritative resources in reproduced structures of domination. (1984, p. 262) To me it seems that how information is stored in a setting depends on how this setting is structured, and how a setting is structured is decided by someone who dominates over a resource such as information that in the end influences how knowledge is exercised in this environment.

Transforming knowledge refers to a process of altering current knowledge creating new knowledge, validating it within each function and collectively across functions. Changing his or her knowledge means that an individual will have to face the cost of altering what he or she does to develop new ways of dealing with the problems he or she faces. I have already concluded that it costs energy to transform a mental schema for how to perform an act of knowledge. It means that to spend this energy people have to gain something to make this effort.

Today knowledge management systems have expanded the distribution of specialist knowledge and made it more transparent. It means that professional groups have become more exposed to market forces and control by a management hierarchy compared to earlier. Also the influence of professional institutions have become weakened by deregulation and globalization, and by IT systems that “threaten professional autonomy with surveillance and remote control”. (Scarbrough, 1999) Some knowledge workers don’t like to be forced to formalize and structure how they perform so that it can be stored on a medium like a computer. It might even be considered degrading. Some might feel that the art of the performance is at risk. If a knowledge worker doesn’t like what is happening at his work place, or feels uncomfortable with a new tool, he might exercise his knowledge less well. To exercise knowledge costs energy, and a knowledge worker stops producing or produce less if he sees that it doesn’t pay to make an effort. In a knowledge organization the one that exercises the knowledge and the one that have the ideas must be rewarded, otherwise he or she stops trying. Therefore it is important to involve the users in how transformations takes place.

I think that the other side of domination might be resistance. Relatively powerless persons might accommodate to power while at the same time protecting their interests and identities

with acts of resistance. To resist power, authority and norms might be a way to exercise domination in a sensitive situation. In Sweden the anesthetists used “patient security” as an excuse to protest against implementing a new information system. In Austria the two professors in anesthesia used “patient security” as a reason for implementing a computerized patient journal. This is an example of how a norm might be used differently in the same type of situation related to personal interest of the group it may concern. The same norm sanctions different behaviours at different places.

I have already written that how effective integration mechanisms are in an organizational setting depends on the existence of a common language. Then there is a local discourse that influences the outcome of what takes place. If signification, or the meaning people give phenomenon, is structured in and through language, language at the same time expresses important aspects of domination, and then the codes that are involved in signification have normative force. I view what is said as an attempt by people who dominate the local discourse to direct the efforts of members in their community, by controlling or exercising domination over some of the underlying thoughts and feelings that guide their actions. It seems to me that investigating who really dominates over the outcome of knowledge management activities is an underestimated phenomenon but must be reckoned with.

10. How to manage people who think?

I have already written that, if we want to compete globally, the essence of management is to make knowledge productive. How to improve knowledge productivity is actually considered as one of the most important economic issues of our time by organizations such as OECD. Now it is therefore time to reflect on the question that this paper poses: How to manage people who think? How an organizational setting is structured depends on modalities such as interpretative schemes, authoritative and allocative resources and norms for use and norms for explanation, as is shown by the figure on page 14. Practices are structured along certain lines, according to Giddens. These are: Procedural rules – how a practice is performed, Moral rules – appropriate forms of enactment of social action, Material resources – means of production, commodities, income, consumer and capital goods, Resources of authority - how time and space are organized, production and reproduction, social mobility, legitimacy and authority. When making an effort to manage people you monitor and manipulate with these modalities. How practices are structured depends on what is communicated through certain interpretative schemes that are acted out. Knowledge workers exercise their knowledge in communities of practice that have a shared repertoire of communal resources, language routines, artifacts, tools, stories and so on, that emerge from practice and are possessed by practitioners as tools of practice. They use interpretative schemes, defined by Giddens as standardized elements of stocks of knowledge applied by actors in the production of interaction. During the interviews in this project appeared a need for influencing and transforming the interpretative schemes that are used. *“You need a new view of things”* as one of the interviewees expressed it and how do you get that: *“By giving examples...by managing new projects, by design, by talking a language so that others understand the ambition with the product, it’s purpose and soul...”* (industrial designer at Electrolux) Working with people who think means working with and transforming interpretative schemes.

Here I will discuss influencing the interpretative schemes with a focus on the conflict between creativity and control, why supporting diversity, and implications of implementing new information and communication technology.

•A conflict between creativity and control

Intellectual curiosity is often the product of earlier anxiety. Anxiety inhibits learning but anxiety is also necessary if learning is going to happen at all. But individual learning can be a dangerous thing when the organization's value system and culture don't have enough freedom to allow individuals to do what they need to do. To be creative you have to invest in mental activity and it costs energy. As a leader it is important to support a culture of mindfulness and experimentation. It is also of vital interest to try to manage the very difficult conflict between creativity and control.

"Creativity is about generating many experiments or combine many facts to generate new thoughts", explained an industrial designer I interviewed.

Good advice when managing creative people is to keep them away from the biggest customers, from critics and anyone whose primary concern is money. The virtues of doing innovative work in isolation can never be underestimated.

"Creativity has to do with being brave. Stepping out of something and into something else. It is about freedom, it takes time and what comes out is never certain", said another of the interviewees.

What foster creativity is not always rational management. It starts with hiring people who have self-confidence to reject the organizational code. Hire people with skills you don't think you need. Creativity is in general also a function of the quantity of work produced. Therefore reward active people. One middle manager at Ericsson told me this story: *"Group A is told to present at least ten new ideas for product development. Group B is asked to present at least 100 ideas. What happens? Group A manages to present 13 new ideas. Group B presents 80 new ideas. What do I want to tell you with this story? Well, somewhere somehow we limit ourselves already from the beginning. Therefore it is very important how we formulate our goals and visions. We should formulate the goal so that we at least can touch it from below."*

Companies should concentrate on designing the processes that knowledge workers carry out rather than measuring their performance.

"In a knowledge organization you should plan action starting with peoples ideas and competence instead of sorting after products...One should organize more from who is in the company than from what is coming out...all the knowledge is cut off because we work so much in product categories. You start out with the products instead with the people".
(industrial designer Electrolux)

"When I work I prefer to start with an idea. Then I test it. The tradition is to put all the toys in a line and then try to mix it together. It is a different way to adress the problem. It is difficult to explain how I have a different way to view things, communicate, talk about different things and have a different perspective."(industrial designer Electrolux)

Today time is a valuable asset as well as knowledge. It takes time to develop knowledge, new ideas and innovations. People need time to think. But time costs money. But if we do not get time to develop knowledge we have nothing to contribute. There exists a conflict between

how we view time and money, between knowledge and time and between money and knowledge.

•Why supporting diversity

Today the job market is characterized by growing job mobility and job insecurity and technology is blurring the lines between work and home. In a globalized economy people move around much more, both between countries but also between professions and companies. We have to learn accepting and appreciating differences. Also diversity is known to drive innovation. Innovation comes when you intersect two different things. Not only can diversity be helpful in finding good solutions but it can even be more beneficial than individual competence. A diverse population of individuals each with a different weak heuristic will outperform a single agent with a very strong heuristic. Remarkably enough one doesn't get the same improvement from using a diverse population of agents with strong heuristics. The reason is that the strong heuristic all tend to be similar to one another-they know the same tricks, as it were-and so tend to get stuck on the same local peaks. Groups outperform isolated individuals. Diversity is therefore a way to adapting to complexity. Diverse groups good at solving problems will tend to be ones whose members have diverse ideas about which problems they ought to solve. The logic of diversity explains why democracy is difficult but necessary.

Put together teams of people that do not have the same opinions and courage to oppose and question what is going on in the organization. But it craves a strong and self-assured leadership. Make knowledge management an integral part of teamwork. Integrate knowledge transfer in the succession planning process. The workforce must reflect the diversity of those it serves to provide appropriate services and promote equality.

"Diversity is when you are not afraid to expose yourself to other views and opinions. Diversity are different personalities. It is very easy to gather a lot of nice people that you like around you. It is more difficult to pick people you do not like. Do we have to fit into the group? It is on that level you have to start thinking. Nothing is so "not-creative" as having a group around you that is exactly the same". (Industrial designer at Electrolux)

"The word diversity is often used in connection with women-men or foreigners, unfortunately. For me diversity means personality. And now it becomes difficult. Ericsson have many nationalities but they have the same type of personality. That's what makes Ericsson what Ericsson is. That's what is typical Ericsson." (Middle manager Ericsson)

"Diversity is the same as different types of competence that is put together into something more complex. You must see things from different perspectives. Diversity can be that something should fit many different types of people when it comes to industrial design and product development. Before we lived in simple societies now everything is much more complex. People have the need to identify themselves, one way can be to find products that you can identify with. Look at the mobile phones. It is one technology but they have different software, different frames and so on". (free-lance industrial designer)

When I write this the leadership of both Ericsson and Electrolux consists of only Swedish men, from the lower and the middle class, educated not at the best universities. The chairman of the board is the same in the two companies. He used to be the head of Electrolux. Once in a seminar April 2005 he said in front of a whole group of female entrepreneurs: "Once, when I

was the head of Electrolux I threatened to hire only women one year. That was not very popular. It caused wild protests”. Then he laughed. The comments above show that diversity is a complex but difficult phenomena to deal with. It costs energy, intelligence and courage to put together an interesting leadership in a globalized company. The interpretative scheme for what kind of competence that is needed must be transformed.

•Implementing new information and communication technology

If Thomas Bayes (1702-1761) ideas about the prediction of future events from one or two examples is correct and our brain is a Bayesian-reasoning machine then with the correct prior, even a single piece of data can be used to make meaningful predictions. Then it becomes very important to supply “the correct” information for the people that think and diagnose.

One way to do this is to implement new information-and communication technology and computerize work tools and work processes. The knowledge society is also characterized as a society in which we invest in people implementing IT. Implementing new information and communication technology often drives innovation. But there is a conflict between technical artifacts and human beings. New technology manipulate with mental schemas and how a person make sense of his or her job. Technology are arenas for social experiments. People must be more flexible and willing to learn and un-learn. But it costs energy to be flexible. The demand on employees to be flexible creates increased demand on management to manage phenomena such as burn-out.

Several times I have already stated that exercising knowledge is a complicated activity consisting of many dimensions. Explicit knowledge is knowledge that can be formalized and written down in a document. Tacit knowledge is something that is understood without being openly expressed. You have “it” in your hands. Tacit knowledge is also knowledge that might be difficult to “un-learn”. When a professional perform a certain duty he or she does it in the same way every time. It becomes procedure and a handicraft.

The interpretative schemas for how knowledge in a specific organizational setting should be exercised is influenced by the availability of resources but it also influence the availability of resources. One of the resources can be a kind of mental capacity that is geared into achieving certain goals. When trying to achieve different goals the knowledge worker is moving inbetween control and creativity. Here time and technology combined with personality are resources that influence what can be achieved and the end result.

The view of new information and communication technology as arenas for social experimentation might have interesting implications for coordination and enhancement in organizations.

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